

U.S. Army Center for Health Promotion and Preventive Medicine

A SOLDIER'S GUIDE TO STAYING HEALTHY IN TROPICAL SOUTH AMERICA

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INTRODUCTION

This country-specific guide should be used in conjunction with [GTA 08-05-062, Guide to Staying Healthy](#), and is intended to provide information that can help reduce your risk of Disease and Non-battle Injuries (DNBI) when deployed. This health threat and countermeasure information is based on the most current data available from U.S. Department of Defense medical agencies at the time of production. In addition to the information in this guide, you should also receive force health protection, health threat, and preventive medicine countermeasures training/briefings prior to and, as required, throughout the length of your deployment.

TROPICAL SOUTH AMERICA OVERVIEW

Tropical South America includes ten countries: [Bolivia](#), [Brazil](#), [Colombia](#), [Ecuador](#), [French Guiana](#), [Guyana](#), [Paraguay](#), [Peru](#), [Suriname](#), and [Venezuela](#). Tropical South America is divided into three regions: the Andes Mountains region, the interior lowlands, and the continental shield. The Andes region runs parallel to the Pacific shore and is an extremely mountainous area that is prone to earthquakes; volcanoes are present, but mostly inactive. Many of the mountain peaks are snow-capped year round. The interior lowlands range from large, grassy, almost treeless plains in the north to a dense tropical rain forest through much of the region. In the east, the continental shield is made up of the northern Guinea and southern Brazilian Highlands, which are two unequal sections separated by the Amazon Lowlands. The borders of the region include the Atlantic Ocean in the east; Uruguay, Argentina, and Chile in the south; the Pacific Ocean in the west; and Panama in the north. Elevation ranges from 7 feet below sea level along the Suriname coast to 22,205 feet above sea level in the Andes of Peru. The lowlands climate is tropical with temperatures generally ranging from 70° to 90° F and with summer highs that can exceed 100° F. The highlands and mountainous areas have cooler temperatures with an average annual high of 66° F and low of 39° F. Rainfall varies considerably. Coastal Peru is one of the driest places on earth with almost no rain along the border with Ecuador. Much of the Amazonian rain forest receives 80-100 inches of rainfall per year; Quibdo, Colombia, receives 350 inches per year.

TROPICAL SOUTH AMERICA RISK ASSESSMENT

Based on a combination of all major infectious diseases that occur in a country, an [overall country risk level](#) is assigned as low, intermediate, high, or highest risk. Bolivia, Brazil, Columbia, Ecuador, French Guiana, and Guyana are HIGH RISK for infectious diseases; Paraguay, Peru, Suriname, and Venezuela are INTERMEDIATE RISK for infectious diseases. Diseases of military importance to forces deployed to this region include brucellosis, diarrheal diseases, [hepatitis A and E](#), and [typhoid fever](#), all acquired by consuming contaminated food, water, and dairy products; vector-borne diseases such as [American trypanosomiasis](#) (Chagas disease), Bartonellosis (Oroya fever), [dengue fever](#), [filiariasis](#), [leishmaniasis](#), [malaria](#), mansonellosis, Mayaro virus, Oropouche virus, [plague](#), Venezuelan equine encephalitis and [yellow fever](#), which are acquired through the bites of various insects; [leptospirosis](#) and schistosomiasis from swimming, wading, or other skin contact with contaminated water; [hantavirus pulmonary](#) syndrome, hemorrhagic fevers, [rabies](#), and [Q fever](#) from animal contact; [meningococcal meningitis](#) and [tuberculosis](#) from contact with human respiratory secretions or droplets; and [sexually transmitted diseases](#). Environmental factors also pose a significant health risk to deployed forces and include sewage, agricultural, and industrial contamination of water and food supplies; extreme heat; high altitude illness; and localized air pollution in metropolitan areas.

INCREASED REGIONAL DISEASE THREATS

Increased vector-borne disease threats include dengue fever, leishmaniasis, malaria, Oropouche virus, and Venezuelan equine encephalitis. All are transmitted year-round. Dengue fever and malaria occur throughout the region. Significant risk for malaria occurs at elevations up to 6,600 feet. You are at a higher risk for malaria in rural and jungle areas and for dengue fever in coastal, urban areas. Leishmaniasis can occur anywhere in the region, but is a significant threat in the jungle and forested highland areas of Colombia. Oropouche virus is a threat in rural, forested areas of Brazil. Venezuelan equine encephalitis occurs mostly in rural areas of Venezuela, but human cases have occurred in the border areas of Colombia.

FIELD SANITATION TEAM

Each company-sized unit has a Field Sanitation Team (FST) whose members are trained (40-hour course) and fully equipped IAW [AR 40-5](#), [FM 4-25.12](#), and [FORSCOM REG 700-2](#). Know who the members of your FST are, and know how they can assist in preventing medical threats to your health. Become familiar with FST equipment and training.

TOXIC INDUSTRIAL CHEMICALS AND MATERIALS

When deployed, you may face health risks from industrial chemicals and materials as a result of activities by terrorists or warring parties; accidents related to improper design, maintenance, or operation of indigenous industrial facilities; inadvertent exposure to toxic waste materials in the environment; or improper handling or disposal of hazardous material with which our own forces deploy. The degree of health risks depends upon many parameters. Consult your medical authority for additional information.

VECTOR-BORNE DISEASES

Several vector-borne diseases are present in Tropical South America. They include [dengue fever](#), [filiariasis](#), [malaria](#), Mayaro virus, Oropouche virus, Venezuela equine encephalitis, and [yellow fever](#) from mosquitoes; Bartonellosis and [leishmaniasis](#) from sand flies; [plague](#) from fleas; mansonellosis from midges or black flies; [onchocerciasis](#) from black flies; and [American trypanosomiasis](#) from “kissing bugs.” There may be other diseases spread by various insects and ticks. Your local medical authority will determine if these diseases or other vector-borne diseases are a threat in your specific location and provide appropriate countermeasures.

- Take your malaria prevention pills when directed to do so. This is CRITICAL. Normally, you will begin taking medication prior to arriving in the area, while in the area, and after returning home.
- Use the [DOD Insect Repellent System](#) detailed in [GTA 08-05-062](#) to reduce your risk of acquiring a vector-borne disease. Wear permethrin-treated uniforms with trousers tucked into boots, sleeves rolled down, and undershirt tucked into trousers. Wear DEET on exposed skin.

- When deployed to this region, [sleep under a permethrin-treated bed net](#) to repel insects and further reduce risks of vector-borne diseases. Many insects in this region feed during the night, including mosquitoes that transmit malaria.
- When using both DEET and sunscreen products, apply sunscreen to the skin first so it does not interfere with the effectiveness of the DEET. After 30 minutes to an hour, apply the DEET. This allows the sunscreen to penetrate and bind to the skin first.

FOOD-BORNE AND WATER-BORNE DISEASES

The diseases of greatest risk, in both rural and urban areas, are bacterial and protozoal diarrhea, hepatitis A and E, and typhoid fever, associated with contaminated food, water, and ice. You are at especially high risk for typhoid fever in large urban areas of Guyana. Sanitation varies with location, but is typically well below U.S. standards. Do not consume any food, water, or beverages (to include bottled water) that have not been approved by the U.S. military. Assume all non-approved food, ice, and water is contaminated. Water and food items available in this region, including dairy products, fish, fruits, and vegetables, may contain unsafe levels of pesticides, chemical fertilizers, bacteria, and viruses. Contamination with human or animal waste is widespread. Even a one-time consumption of these foods or water may cause severe illness. See [GTA 08-05-062](#) for appropriate countermeasures.

HOT AND COLD WEATHER INJURIES

Temperature extremes in the Tropical South America region may impact military operations. Heat is a medical threat for soldiers deployed to this region, especially during the early phase of deployment; acclimatization is critical. Cold injuries are a threat in the mountainous areas. The effects of cold weather are more severe in high mountainous areas due to reduced oxygen and lower air pressure. When deploying to the mountainous regions of Tropical South America, check with your unit on the requirement for packing the extended cold weather clothing system. See [GTA 08-05062](#) for appropriate countermeasures

SEXUALLY TRANSMITTED DISEASES

[Sexually transmitted diseases](#) are highly prevalent in this region. Gonorrhea, chlamydia, and other infections are common, and may affect a high percentage of personnel who have sexual contact. Human immunodeficiency virus (HIV) and hepatitis B occur throughout the region. Though the immediate impact of HIV and hepatitis B on an operation is limited, the long-term impact on your individual health is substantial. See [GTA 08-05-062](#) for appropriate countermeasures.

HIGH ELEVATIONS

High altitude illness is a significant threat in the Andes region. Even urban areas such as Bogotá, Colombia, have elevations up to 8,600 feet. Military operations occurring at elevations over 6,000 feet can seriously affect unit and individual effectiveness. Serious illness or death can result if you ascend rapidly without allowing for acclimatization. Remain well hydrated; individual water requirements are greater at higher altitudes.

- When deployed to high mountain and high elevation urban areas, be observant of the common symptoms of mountain sickness: headache, nausea, vomiting, dizziness, fatigue, irritability, and coughing. Seek medical attention immediately if you experience any of these symptoms.
- Pyridostigmine bromide tablets may increase the chance of dizziness or fainting during the first 24 hours at high altitude if you are not acclimatized.
- Lower oxygen levels at high altitudes ("thin air") combined with the heavier work requirements when wearing mission-oriented protective posture (MOPP) gear can increase your risk of high altitude illnesses. When wearing MOPP gear at higher altitudes, you may require more time and concentration to perform assigned tasks.
- For appropriate countermeasures during high altitude operations, see [GTA 08-05062](#) and [GTA 08-05-060, A Soldier's Guide to Staying Healthy at High Elevations](#).

HEARING PROTECTION

It is essential that you use properly fitted [hearing protection](#) during military operations. Exposure to high-intensity noise may cause hearing loss that can adversely affect your combat effectiveness and individual readiness. Good hearing is essential to mission success. If you are a dismounted soldier, the [Combat Arms Earplug](#) (NSN 6515-01466-2710) will protect you from the impact noise of weapons fire while only slightly interfering with voice communications and detection of combat sounds such as vehicle noise, footfalls in leaves, and the closing of a rifle bolt. While not as effective as the Combat Arms Earplug in preserving your ability to hear important mission-related sounds, noise muffs or standard earplugs are very effective at preventing noise-induced injury. If you are a member of vehicle or helicopter crews, your combat vehicle crew or aircrew helmets have built-in hearing protectors.

ORAL HEALTH

[Dental disease](#) is a common problem during deployments due to the challenge of maintaining good oral hygiene. You should deploy with toothbrush, dental floss, and fluoride toothpaste. Daily flossing and twice daily brushing of teeth is the best way to ensure prevention of periodontal disease and to decrease your risk of problems such as trench mouth and tooth decay. In difficult tactical environments, teeth should be brushed at least once a day. Seek medical attention immediately at the onset of any dental problems.

SKIN DISEASES

Skin irritations and infections, such as athlete's foot and ringworm, are common medical threats during any deployment and are commonly caused by fungi. The best prevention is to maintain clean, dry skin. See [GTA 08-05-062](#) for additional countermeasure information.

HAZARDOUS ANIMALS AND PLANTS

- Dogs, cats, and bats are the main source of rabies in this region. You can be exposed to rabies through bites or, more rarely, when infected saliva contacts wounds or moist membranes, such as the nose or eyes. Sleeping under a bed net will offer protection from vampire bats, which are present in some lowland regions.
- Rodents may carry viruses such as Bolivian hemorrhagic fever in Bolivia; hantavirus pulmonary syndrome in Bolivia, Brazil, and Paraguay; and Venezuelan hemorrhagic fever in Venezuela. Disease can result if dust contaminated with rodent excreta or saliva is inhaled or if contact is made with abraded skin. Your risk is increased in poorly ventilated rodent-infested areas.
- Many species of highly poisonous snakes, which are well camouflaged and very aggressive, are common in all terrestrial habitats in the region. Consider any snake encountered as poisonous, and do not handle. Seek immediate medical attention if bitten; untreated snakebites may cause serious illness or death within 1 hour.
- Numerous caterpillars in the tropics have poisonous hairs that may cause severe dermatitis. Centipedes, spiders, and scorpions of the region can attain considerable size and are capable of inflicting painful bites and stings that cause swelling, local tenderness, or necrotic lesions. If possible, avoid sleeping on the ground. Shake out boots, bedding, and clothing prior to use, and never walk barefoot. Always check dug-in fighting positions for potentially dangerous animals. If bitten or stung, seek medical attention immediately.
- Africanized honeybees (AHB) are endemic throughout much of the region. AHB are extremely aggressive and defensive of their hives; they travel in large swarms to sting intruders. Operations in wooded areas increase the risk of troops encountering AHB hives.
- Piranhas are found in freshwaters of northern South America. Piranhas travel in schools that can devour a 300-pound animal in minutes. Electric eels, which live in the waters of the Amazon Basin, can deliver an electric charge strong enough to injure or kill a human.
- Some regional plants have thorns, stinging hairs, or toxic resins that may puncture the skin or introduce poison into the skin causing skin irritation, rashes or infections. Avoid skin contact with plants when tactically feasible.
- Some regional plants may cause systemic poisoning if leaves, berries, flowers, or other plant parts are chewed or swallowed. Some regional plants have fruits that resemble edible varieties, but contain dangerous compounds and are extremely poisonous if ingested. Contaminated milk may occur if cows eat white snakeroot, a plant commonly found in this region. Symptoms include dizziness, vomiting, irregular heartbeat, and delirium or

hallucinations.

- Contact with the smoke from the burning of harmful plants can also cause skin rashes and damage to your lungs.
- Clean your clothing after contact with harmful plants. Decontaminate clothing by washing with soap and water.

PRE-DEPLOYMENT HEALTH INFORMATION

[Complete the Pre-Deployment Health Assessment \(DD FORM 2795\)](#) to assess your state of health before deployment and to assist health care providers in identifying your medical needs and providing present and future medical care to you. You will not have access to your health care record during the deployment. The Adult Preventive and Chronic Care Flowsheet ([DD FORM 2766](#)) will be used as your deployment health record. This document will include information on all your immunizations, any medications you are currently taking, and any ongoing medical problems that you may have. When you go through readiness processing, ensure that all appropriate information is documented on your DD FORM 2766. When you return home, this information will be placed in your regular health record.

INFORMATION ABOUT YOUR HEALTH CARE WHILE DEPLOYED

It is important that you know where to seek health care while deployed. This may or may not be through the same channels as your home station. Ask your chain of command for more information. While deployed, you must maintain your health and seek care whenever an illness or injury threatens your ability to complete your tasks. Your unit is depending on you. It is always better to seek care early so that your problems can be documented appropriately and taken care of immediately.

POST-DEPLOYMENT HEALTH INFORMATION

[Complete the Post-Deployment Health Assessment \(DD FORM 2796\)](#) to assess your state of health after deployment and to assist health care providers in identifying your medical needs and providing present and future medical care to you.

- If you become sick after you return home, tell your physician that you were deployed.
- Complete malaria medications as directed, and receive follow-on medical care/tests as directed.

Contact your Preventive Medicine or Medical Support Unit for more information.



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